

# Optimizing Entrance Skin Dose and Radiograph Quality on Panoramic Examination by using Grey Level Co-Occurrence Matrix

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## Abstract

**Context:** The usual set of exposure factors (66 kV, 6.3 mAs, 14.4 seconds) is used regardless of the body size of patients. It produces around 247.46  $\mu$ Gy radiation dose. This condition sometimes produces overexposure images. **Aims:** In order to have insight into the variation of radiographic image quality, the research was conducted with several sets of exposure factor which is implemented in several random patients. The aims are to find the optimal set that gives a clear justification according to 3 radiologists and to see the correlation between the Body Mass Index (BMI) and the radiation dose. **Settings and Design:** This study was conducted on 36 adult patients. **Methods and Material:** The patients are exposed to variations of exposure factors using The panoramic dental unit. The anatomic assessment was performed by 3 radiologists. Entrance Skin Dose (ESD) is measured by using a survey meter. **Statistical analysis used:** The radiographic quality assessment was obtained quantitatively by using Gray Level Co-Occurrence Matrix (GLCM) method. The GLCM, Radiologists assessment, and ESD are analyzed using ANOVA and regression analysis. **Results:** The exposure factor setting at 62 kV, 4.5 mAs, and 14.4 seconds are capable to reveal good anatomical structures on panoramic radiographs. Which is not statistically different for all BMI with significant. level 5 %. It produces the lowest radiation dose at 137.48  $\mu$ Gy among the data. However, the regression analysis shows that the lower ESD might produce better justification ( $R^2 = 0.24$ ). **Conclusions:** This study has provided a method that gives the optimal set of exposure factors for all the BMI of the patient.

Key-words: Panoramic, Entrance Skin Dose, Radiographic Quality, Grey Level Co-Occurrence Matrix

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